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RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 883122
W.O. #481104
JANUARY 9, 1989

DESIGN ACCEPTANCE FOR STRAIGHT TAPER TURKEY CHOKE TUBES

DESIGN ACCEPTANCE FOR STRAIGHT-TAPER TURKEY CHOKE TUBES

ABSTRACT:

Research finds the design change of the turkey choke tube, from a parabolic taper to a straight taper, to be acceptable. The evaluation consisted of, patterns shot at 40 yards, using one Model 11-87, two barrels, two with straight taper and two with parabolic taper choke tubes.

Prepared by: D.R. Thomas
Date Prepared: JANUARY 9, 1989

proofread and cleared by:

J.R. Snedeker
Staff Engineer

W.H. Coleman, II
New Products Research Lab Director

DESIGN ACCEPTANCE FOR STRAIGHT-TAPERED TURKEY CHOKE TUBES

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On November 7, 1988 a request was received from T. Powers to
conduct a Design Acceptance test on the proposed change in 12
gauge turkey choke tubes. The parabolic taper was changed to a
straight taper to facilitate inspection of the tube. The test was
done to assure that no pattern performance would be lost due to
the change.
The test would use one Model 11-87 12 gauge shotgun, two barrels,
two straight taper choke tubes, and two parabolic taper choke
tubes. The testing was to compare pattern densities and central
thickening of the patterns shot with the two designs.

SCOPE OF TEST:

To verify that the proposed straight taper design would perform
as well as the parabolic taper in pattern density and central
thickening.

TEST RESULTS:

The straight taper tube is comparable to the parabolic taper tube
in density and central thickening.

R2518500

REPORT TEXT:

EQUIPMENT REQUIRED:

GUN: Model 11-87 serial number P170340V
2 choke tubes with a parabolic taper
2 choke tubes with a straight taper

AMMUNITION: Remington SP12NM-6 (3in., 1 5/8oz., 4 dr. eq. Nitro
Magnum)
Lot number 6201504

SHOOTERS: D.Thomas and J. Selan

TEST PROCEDURE:
Five patterns were shot per shooter, per barrel, per choke tube,
for a total of eighty patterns. Five cartridges were cut down to
determine a pellet count.

Patterns were shot by D.R. Thomas and J.E. Selan in the Research
and Development pattern range located in building 52-1A.

Remington ammunition code SP12NM-6 lot# 6201504 was used for all
patterns.

The patterns were analyzed for pattern density and central
thickening using the HP9000 and digitizing tablet.

R2518501

An Analysis of Variance evaluation of the choke tube patterns for the Straight Taper tube vs. the Parabolic taper tube shows that there is not a significant difference between the two types for pattern percentage at the 95% level of confidence.

ANALYSIS OF VARIANCE (pattern percentages)

SOURCE	DF	SS	MS	F	p
FACTOR	1	2.81	2.81	0.31	0.581
ERROR	78	713.30	9.14		
TOTAL	79	716.11			

INDIVIDUAL 95 PCT CI'S FOR MEAN
BASED ON POOLED STDEV

LEVEL	N	MEAN	STDEV	
str-tapr	40	82.598	2.695	(--------------*--------------)
par-tapr	40	82.223	3.320	(--------------*-------------)

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                                      81.90     82.60     83.30
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POOLED STDEV = 3.024

The critical F value [F(.05){1,78}] for this set of data is ~ 3.96 Therefore, since the observed F value is 0.31 < 3.96 we must accept the null hypothesis (i.e. there is no significant difference between the two groups relative to pattern %).

The analysis further shows that there is not a significant difference between the two types of choketubes relative to Central Thickening (at the 95% level of confidence).

ANALYSIS OF VARIANCE (central thickening)

SOURCE	DF	SS	MS	F	p
FACTOR	1	0.263	0.263	0.96	0.331
ERROR	78	21.476	0.275		
TOTAL	79	21.739			

INDIVIDUAL 95 PCT CI'S FOR MEAN
BASED ON POOLED STDEV

LEVEL	N	MEAN	STDEV	
STR-TAPR	40	2.9537	0.4694	(----------*----------)
PAR-TAPR	40	2.8390	0.5747	(----------*----------)

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                                 2.70      2.85      3.00      3.15
```

POOLED STDEV = 0.5247

#481104   DATA SHEET   RP#883122
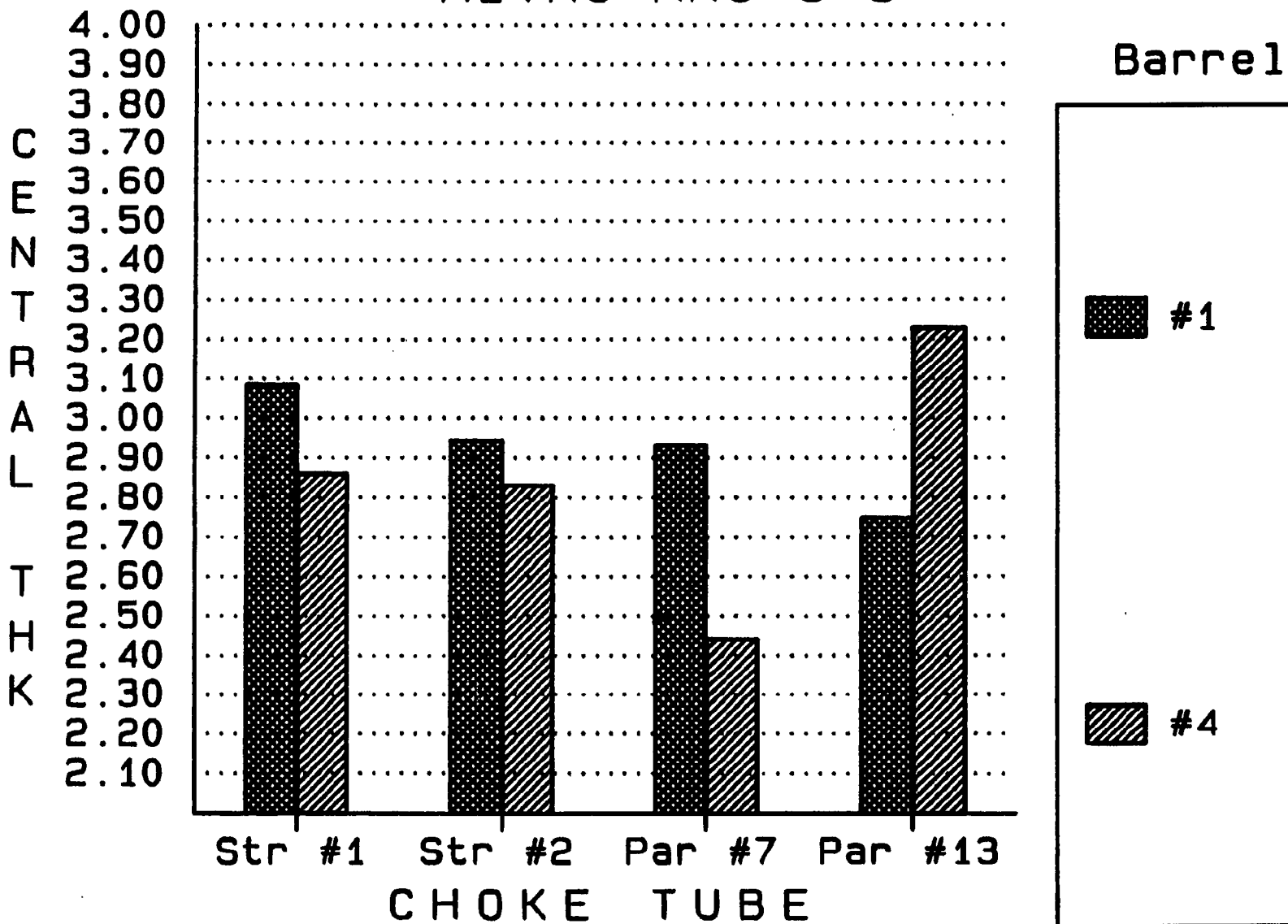
TURKEY CHOKE TUBE PATTERNS
using Nitro Mag 6's (SP12NM-6) 369 pellet avg.

	pat.#	shooter	26 in. barrel #1 pat.%	cen. thk.	26 in. barrel #4 pat.%	cen. thk.
	1	JS	84.8	2.82	82.4	3.54
	2	JS	84.8	2.82	84.3	2.62
	3	JS	87.8	3.00	76.6	2.25
Straight	4	JS	80.5	2.71	82.9	3.03
Taper #1	5	JS	82.9	4.56	82.4	3.00
	6	DT	81.8	3.25	79.1	2.89
	7	DT	83.2	2.94	78.9	2.64
	8	DT	84.8	3.41	80.2	2.44
	9	DT	81.8	2.92	83.7	2.96
	10	DT	82.7	2.43	85.1	3.24
AVERAGE			**83.5**	**3.09**	**81.6**	**2.86**
	1	JS	84.0	2.78	79.9	2.01
	2	JS	81.6	3.49	85.9	3.28
	3	JS	83.2	2.89	79.9	2.73
Straight	4	JS	86.2	2.88	80.8	2.27
Taper #2	5	JS	81.8	2.68	78.3	2.57
	6	DT	83.7	3.07	87.5	3.42
	7	DT	87.5	3.31	85.6	3.72
	8	DT	84.0	3.25	82.9	3.25
	9	DT	79.9	2.39	77.8	2.19
	10	DT	80.8	2.73	81.8	2.87
AVERAGE			**83.3**	**2.95**	**82.0**	**2.83**
	1	JS	84.8	3.82	75.6	2.17
	2	JS	88.6	3.04	76.7	2.11
	3	JS	88.3	2.66	84.0	2.60
Parabola	4	JS	82.4	3.47	82.7	2.72
Taper #7	5	JS	79.7	2.38	83.5	2.76
Dsn/Acpt	6	DT	79.7	2.54	81.3	2.41
	7	DT	82.4	2.49	86.7	2.55
	8	DT	87.0	2.87	78.3	2.40
	9	DT	82.4	3.75	75.3	2.16
	10	DT	83.7	2.32	82.7	2.55
AVERAGE			**83.9**	**2.93**	**80.7**	**2.44**
	1	JS	82.1	2.61	81.6	3.12
	2	JS	81.6	2.58	81.3	2.85
	3	JS	79.9	2.31	82.7	4.65
Parabola	4	JS	81.8	2.36	84.3	3.64
Taper #13	5	JS	83.2	2.34	83.5	3.11
Dsn/Acpt	6	DT	85.6	2.67	80.2	2.70
	7	DT	74.0	2.17	81.8	2.47
	8	DT	80.8	3.81	85.1	3.42
	9	DT	79.1	3.71	85.4	3.26
	10	DT	86.2	2.93	82.9	3.08
AVERAGE			**81.4**	**2.75**	**82.9**	**3.23**

R2518503

Turkey Chk Patterns
NITRO-MAG 6's

Barrel

▨	#1
▧	#4

CENTRAL THK

4.00
3.90
3.80
3.70
3.60
3.50
3.40
3.30
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10

Str #1   Str #2   Par #7   Par #13

CHOKE TUBE

Turkey Chk Patterns
NITRO-MAG 6's

Barrel

A
V
E
R
A
G
E

%

85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5

Str #1   Str #2   Par #7   Par #13

C H O K E   T U B E

#1

#4